



Apollo 8 Commander Frank Borman says his crew's Christmas message of 20 years ago is still appropriate today. Story on Page 3.



The crew patch for the next Space Shuttle mission represents the energy and dynamism of America's space program. Photo on Page 4.

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APOLLO 8: Twenty years ago, a bold maneuver became salvation of troubled year

[Editor's note: This is the first part of a two-part article on the events and decisions leading up to the Christmas 1968 flight of Apollo 8. The conclusion will appear next week.]

By Brian Welch

In the course of a frightful year, one unparalleled in the American experience for the impact and compression of truly historic events, it was, in the end, a voyage of exploration that became the most significant news story of 1968.

To categorize the year as merely "turbulent" would be a historic understatement. It was the

year when Bobby Kennedy and Martin Luther King fell to assassins' bullets; the year when a sitting President announced he would neither seek nor accept the office again; it was the year of renewed race riots in virtually every major American city; the year of sit-ins, draft card burnings and the year when the first airliner was hijacked to Cuba.

In the halls of the National Aeronautics and

Space Administration, within the confines of a technical world where the absolutes of mathematics and science might have been expected to lend a certain stability, there was also tension and uncertainty.

The space agency was still struggling to recover from its worst nightmare and most harrowing accident—the loss of the Apollo 1 crew in a spacecraft fire on the launch pad in January 1967. The deaths of Grissom,

White and Chaffee had shaken the country the year before and had revealed widespread problems within the lunar landing program. The recovery had not been easy, either technically or politically, and criticism had been harsh.

As the recovery continued and the weeks passed, there was a keenly felt, inexorable erosion in the margin for meeting President Kennedy's goal of landing men on the Moon before the end of the decade. "The probability of landing on the Moon before 1970 is not high," wrote Robert Gilruth, the first

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Apollo 1 crew in a spacecraft fire on the launch pad in January 1967. The deaths of Grissom,



JSC Photo by Bill Blunck

TALL ORDER—Santa Claus made a preliminary visit to JSC Wednesday to tour the site and attend the Technical Services Division's Christmas party. Santa's visit, arranged by Roger Nagel of Tech Services, was a big hit outside Bldg. 1. Tech Services Division Chief J.D. Williams provided transportation in his Model A so that Rudolph and his crew could rest up for the big night.

Return to flight awards presented to JSC employees

JSC civil service and contractor employees who made substantial contributions to NASA's return to flight were recognized Thursday in JSC's Bldg. 2 Teague Auditorium.

The awards were designed to "recognize the outstanding success of the STS-26 flight and the post accident events leading to it." About 24,000 people nationwide worked on the return to flight over a span of two years and eight months.

Distinguished Service Medals were presented to JSC Director Aaron Cohen, STS-26 Commander Frederick H. Hauck, NSTS Program Deputy Director Richard H. Kohrs and Mission Operations Director Eugene F. Kranz at NASA Headquarters.

JSC presented awards to 158 people and 43 groups. The recipients were:

NASA Outstanding Leadership Medal: Ronald L. Berry, Daniel C. Brandenstein, Richard A. Colonna, Gary A. Coultas, Daniel M. Germany, Philip C. Glynn, Charles S. Harlan, Tommy W. Holloway, Robert W. Moorehead, Leonard S. Nicholson, Henry O. Pohl, Donald R. Puddy and Paul J. Weitz.

NASA Exceptional Engineering Achievement Medal: Kornei Nagy, Ph.D., John W. Young.

NASA Exceptional Service Medal: Thomas J. Adams, Jr., Walter S. Ankney, Lambert D. Austin Jr., James H. Barnett Jr., Larry E. Bell, Alfred A. Bishop, Karol J. Bobko,

Charles F. Bolden Jr., James E. Bone Jr., Jack C. Boykin, Hubert J. Brasseaux, Alan L. Briscoe, Frederick T. Burns Jr., Frank T. Buzzard, Harry W. Byington, David W. Camp, Norman H. Chaffee III, William A. Chandler, Gary E. Coen, Douglas R. Cooke, James B. Costello, Phillip E. Cota Jr., Richard O. Covey;

Jeffrey R. Davis, M.D., Philip M. Deans, Ronald D. Dittmore, Harold M. Draughon,

Duane L. Duston, Ronald C. Epps, George A. Fiedler, Jay H. Greene, Henry W. Hartsfield Jr., Richard W. Hautamaki, Steven A. Hawley, Ph.D., James E. Hebert, David C. Hilmers, Jay F. Honeycutt, Dallas G. Ives, Marsha S. Ivins, Cheever H. Lambert Jr., Frank C. Littleton Jr., John M. Lounge;

James W. McBarron II, Clay E. McCullough, William G. McMullen, Larry B. McWhorter, Marion E. Merrell, Moises N. Montez, Larry J. Moon, John F. Muratore, Steven R. Nagel, George D. Nelson, Ph.D., Richard W. Nygren, Bryan D. O'Connor, Stephen S. Oswald, Michael L. Peterson, Robert A. Plunkett, Sam L. Pool, M.D., Richard N. Richards, William F. Ritz;

Mark D. Schmalz, David C. Schultz, Charles W. Shaw, Paul E. Sollock, Richard A. Thorson, Richard D. Tuntland, Ronald S. West, Robert D. White and Lawrence G. Williams.

NASA Distinguished Public Service Medal: Robert M. Glaysher and Donald G. Whitman, both of Rockwell.

NASA Public Service Medal: Bohdan I. Bejmuk, Alfred M. Carey
Please see **AWARDS**, Page 4



Review team to study tile damage

Atlantis is back in a processing facility at Kennedy Space Center after its four-day spaceflight, and *Discovery* is next door being readied for America's next trip to space in February 1989.

Atlantis arrived back at Kennedy atop the Shuttle Carrier Aircraft (SCA), a modified Boeing 747, at about 1:30 p.m. CST Tuesday. The Orbiter was hoisted down from its perch atop the aircraft and moved into Bay 2 of the Orbiter Processing Facility (OPF) by early Wednesday.

A longer than normal ferry flight was required for *Atlantis* due to inclement weather along the flight path and shortened daylight hours. The SCA left Dryden Flight Research Facility Sunday and made an unscheduled stopover at Davis-Monthan Air Force Base in Tuscon, Ariz. It also stopped over at Kelly Air Force Base in San Antonio before passing directly over JSC Tuesday on the final leg of its journey.

Post-flight inspections of *Atlantis* have revealed a large amount of

thermal protection system (TPS) tile damage, concentrated around the left forward underside. About 700 tiles were damaged with varying severity, and about 150 will have to be replaced.

An STS-27 TPS Damage Review Team, chaired by Marshall Space Flight Center's John Thomas and including four JSC experts, has been assigned to study the problem. JSC personnel on the team are Jay Honeycutt, deputy manager of the NSTS Program Office; Marion Coody of the Orbiter Systems Integration Office; Gary Coen, a flight director; and Astronaut Don McMonagle.

The team will review the damaged areas in detail, review the prelaunch ice inspection procedures, assess in-flight optical and tracking data, and attempt to determine the source of the damage. The team will then recommend design or procedural changes to reduce the potential for such damage on future flights.

During the next few weeks at

Kennedy, technicians will perform more post-flight inspections of *Atlantis* and begin readying the Orbiter for its next mission, STS-30. Residual propellants will be drained from the Orbiter's tanks next week.

Meanwhile, in OPF Bay 1, *Discovery* is gearing up for STS-29, scheduled for launch Feb. 18, 1989. All three main engines, the forward reaction control system (RCS) and the right-hand orbital maneuvering system (OMS) pod have been installed. Next week, the main propulsion system will be checked for leaks; the fuel cells will be tested; and the environmental control and life support system will be checked.

In the Vehicle Assembly Building (VAB), the two solid rocket boosters (SRBs) for STS-29 have been stacked and were mated to the external tank (ET) Thursday. Connections between the SRBs and ET are now being checked, and closeouts of the elements will continue through the end of the year.

Minor to head Rockwell's space transport division

Robert G. Minor, president of Rockwell Shuttle Operations Co. (RSOC) for the past four years, has been promoted to president of the Space Transportation Systems Division and transferred to division headquarters at Downey, Calif.

Minor will direct the design, development, testing and production of Space Shuttle Orbiters under Rockwell's prime contract with NASA.

He will also direct Rockwell's flight operations support, vehicle and cargo integration, launch support, Orbiter logistics operations and Orbiter improvement efforts.

Linda Bostick, an RSOC spokeswoman, said a successor has not yet been announced. The announcement is expected soon, within one to three weeks, she said.

Minor succeeds Seymour Z. Rubenstein, who has been appointed president of Advanced Systems within Rockwell's Strategic Defense and Technology business segment.

As RSOC president, Minor has been in charge of the day-to-day management of the Space Transportation System Operations Contract (STSOC), a management-oriented contract that consolidated 17 separate Shuttle mission operations contracts in 1985. Minor was a key figure in designing Rockwell's winning bid to administer and manage JSC facilities that include the Mission Control Center, Shuttle Mission Simulator, Shuttle Avionics Integration Laboratory and the Central Computing Facility.

JSC

People

Cohen is Houston Spaceweek chairman

JSC Director Aaron Cohen will serve as Houston chairman of Spaceweek's 20th Apollo Anniversary celebration. Cohen was NASA's project manager for the Apollo Command and Service Modules from 1968 to 1972.

Cohen will join Donald R. Beall, president of Rockwell International, Spaceweek '89 chairman, and Dr. Christopher C. Kraft Jr., National 20th Apollo Anniversary chairman, in supporting the annual celebration of the space program July 16-24, 1989.



Cohen

Nebrig receives management award

Dan Nebrig, executive assistant to JSC Director Aaron Cohen, recently received the National Management Association Texas Gulf Coast Council's 1988 Golden Knight of Management



Nebrig

Award.

The council said Nebrig was chosen on the basis of his extensive experience as a JSC aerospace engineer, project manager and business manager, as well as for being instrumental in forming the JSC NMA chapter in 1984.

Kohrs earns AIAA Space Systems Award

Richard H. Kohrs, deputy director of the National Space Transportation System at JSC, recently received the American Institute of Aeronautics and Astronautics (AIAA) Space Systems Award.



Kohrs

The award was presented in recognition of his "outstanding achievements in the field of systems analysis, design and implementation as applied to spacecraft and launch vehicle technology."

Also receiving the award are Rear Adm. Richard H. Truly, NASA association administrator for space flight, Arnold D. Aldrich, NSTS director, and Robert L. Crippen, deputy director of NSTS operations.

Today

Correction—In its Dec. 9 edition, the Roundup incorrectly reported the extended open season deadline for the Federal Employees Health Benefits Program. The last day to enroll or make changes will be Dec. 23. The effective date of any changes will be Jan. 1, 1988. For more information, call x32681.

Chamber music—The Clear Lake Chamber Music Society will perform a free Christmas concert featuring selections from "The Nutcracker" at 11:30 a.m. Dec. 16 in the Bldg. 2 Teague Auditorium. Performers will be Susan Dahlberg, piano; William Pu, violin; Cao Ming, cello; and Joanna Thompson, vocals.

Basketball and volleyball—Registration for basketball and volleyball leagues will end Dec. 16 at the Gilruth Rec Center. NASA-badged teams sign up at 7 a.m., and non-badged teams at 5:30 p.m. Today is sign-up day for mixed volleyball and basketball. For more information, call x30303.

Cafeteria menu—Entrees: deviled crabs, broiled halibut with lemon butter sauce, liver and onions, chopped sirloin, barbecue link (special). Soup: seafood gumbo. Vegetables: buttered corn, cut green beans, new potatoes, lima beans.

Sunday

Jingle Bell Run—Runners interested in competing on the NASA-JSC teams at the 5-mile Jingle Bell Run through downtown Houston Dec. 18 should call Patrick Chimes, x32397. Entry fee is \$10.

Monday

Exercise class—Class meets 5:15-6:15 p.m. Mondays and Wednesdays at the Rec Center for eight weeks. Cost is \$24. Participants may sign up anytime. For more information, call x30303.

Cafeteria menu—Entrees: bar-

becue beef, Parmesan steak, spare rib with sauerkraut, chopped sirloin, chili and macaroni (special). Soup: French onion. Vegetables: ranch style beans, English peas, mustard greens, French fries.

Tuesday

Cafeteria menu—Entrees: meatballs and spaghetti, liver and onions, baked ham with sauce, chopped sirloin. Soup: split pea. Vegetables: buttered cabbage, cream style corn, whipped potatoes, French fries.

Wednesday

EAA badges—Dependents and spouses may apply for a photo identification badge from 6:30-10 p.m. Monday through Friday at the Rec Center.

Cafeteria menu—Entrees: cheese enchiladas, roast pork with dressing, oven crisp flounder, chopped sirloin, barbecue link (special). Soup: cream of tomato. Vegetables: pinto beans, Spanish rice, turnip greens, French fries.

Thursday

Cafeteria menu—Entrees: roast beef with dressing, stuffed flounder, lasagne with meat, chopped sirloin, chicken fried steak (special). Soup: beef and barley. Vegetables: whipped potatoes, peas and carrots, buttered squash, French fries.

Dec. 23

Cafeteria menu—Entrees: fried shrimp, broiled halibut with butter sauce, chopped sirloin, fried chicken (special). Soup: seafood gumbo. Vegetables: breaded okra, buttered broccoli, carrots in cream sauce.

Dec. 27

BAPCO meets—The Bay Area PC Organization will meet at 7:30 p.m. Dec. 27 at the League City Bank & Trust. For more information, call Earl Rubenstein, x34807, or Ron Waldbillig, 337-5074.

Jan. 10

Flag football and soccer—Registration for the Saturday flag football and mixed soccer leagues will be Jan. 10-24 at the Rec Center. NASA-badged teams will sign up at 7 a.m. each day, and non-badged teams at 5:30 p.m. The sign-up days for the various leagues are: Jan. 10, men's flag football; Jan. 11, mixed flag football; and Jan. 24, mixed soccer. For more information, call x30303.

Feb. 23

Call for papers—The American Society of Quality Control (ASQC) is seeking innovative papers written on subjects such as applications in quality and productivity or the use of data systems for improving quality and productivity and competitiveness. The papers will be presented at the second annual South Texas Quality, Productivity and Data Systems Conference, Feb. 23-24 at the University of Houston's Hilton Conference Center. For consideration, and a brief abstract and biographical sketch, both less than 300 words each, a one page outline and a photograph to South Texas Q&P Conference, Attn. Eugene Berger, Box 890506, Houston, 77289. For more information, call Berger, 333-0967.

April 27

Space Flight Symposium—The Texas Bay Area Chapter of the Society of Hispanic Professional Engineers (SHPE) will cosponsor "The Challenge of Space Flight: A Space Symposium" to be held April 27-28 at JSC. The joint effort will be aimed at disseminating information to minority groups, educators, technical professionals and managers of EEO programs concerning current and future manned space activities and skills needed by JSC to meet the manpower needs of the 21st century. For more information, call Otilia Sanchez, x39319.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays:

General Cinema (valid for one year): \$3 each.

AMC Theater (valid until May 31): \$2.95 each.

Sea World—San Antonio (year): children, \$13.56; adults, \$15.96.

New Year's Eve Dance (Dec. 31, 7 p.m., Rec Center), includes cold cut buffet before and breakfast after, \$12.50. Tickets go on sale Monday.

Ice Capades (Dec. 31, 11 a.m., Summit): \$7.

The Arkansas Bear (Feb. 18, 7 p.m., Bayou Theatre, UHCL): \$3.

Pericles, Prince of Tyre (April 22-28, 8 p.m., Satellite Theatre, UHCL): \$4.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2.

Property

Sale: Executive bachelor residence located 3 blks. from JSC west fence, light and bright, most amenities, \$98,700. 488-0397.

Sale: Alvin area, 3-1-1, brown brick house, 25 min. from NASA, well established neighborhood, 2 blks. from high school, \$45,000. Kay, x32251 or 331-3379.

Sale: 60' x 12' mobile home, 2-1, curtains and appli. x30122 or 1-595-2265.

Sale: Middlebrook, 3-2-2, study, FPL, wet bar, covered patio, large lot, ex. cond., FHA assum., 10%. 480-9363.

Lease/Sale: Brookforest, CLC, 4-2-5-2, 2,500 sq. ft., lovely contemporary, all formal, beautifully landscaped, near schools, \$1,100/mo. or \$129,900. x37016 or 488-7224.

Sale: Friendswood/Sun Meadow Estates, wooded lot in established neighborhood, cul-de-sac, bordered by stream & golf course on 2 sides, approx. 245' deep & up to 86' wide, approx. 1/3 acre, util. on site, \$31,500. Doug, x32860 or 486-7412.

Sale: League City, 3-2-2, cul-de-sac, landscaped, \$3,000 equity, FHA 10% fixed assum. David, x35464.

Lease: Vail, Colorado, prime ski season, Feb. 25-Mar. 4, 1989, fully furnished, full kitchen and dinette, FPL, clubhouse, sleeps 6, \$795. Jan, x33434 or 333-5266.

Sale: College Station, 3-1, 3 blks. from A&M campus, \$500 down, assume fixed FHA 9.5%, \$398/mo. 326-1278.

Lease: Lake Tahoe, Heavenly Valley, walk to ski lift from condo, fully equipped, accommodates 6, Mar. 20-26, 1989, casinos nearby, \$425. 474-5610.

Rent: Mobile home lot, \$85/mo., \$50 dep., Oklahoma and Kinne, Bacliff. 488-1758.

Cars & Trucks

'67 Mustang 289 V-8, 3 spd., A/C, new exhaust, new paint, red, AM/FM stereo, headers, mags, runs great, \$2,995, OBO. Mike, x38169 or 482-8496.

'87 Sterling 825SL, luxury and performance automobile, all options, low mi., \$19,500. 486-1404.

'80 Mazda GLC, 5 dr., auto., radio, new tires, 52K mi., 1 owner, good cond., \$2,000. Linda, x30718 or 996-0462.

'87 Hyundai Excel GL, take over payments or refinance, 27K mi., hatchback, Panasonic AM/FM cass. C. Mason, x34231 or 473-1287.

'85 Mercury Cougar, A/C, P/S, P/B, elect. windows and seats, AM/FM, new tires, cruise,

\$6,250. Wendel, 332-2318.

'72 Datsun 240Z, 4 spd., AM/FM, A/C, all orig., good cond., good tires, runs great, looks great, \$2,500, OBO. Ben, x36795 or 332-5090.

'75 Mercedes Benz 450 SEL, blue, auto. trans., PS/PB, options, new Pirelli tires, newly installed AM/FM stereo w/cass. (4 speakers), newly installed A/C, pwr. sunroof, cruise control, P/W, floor mats, int. very clean, ext. and engine in fine cond., \$9,500, OBO. Gary, x30857 or 242-4799.

'87 Ford F350 XLT, crew cab dually, gasoline 460 engine. Danny, (409) 925-5881.

'88 Beretta GT, 2.8 liter V-6, sport suspension, tinted windows, JVC stereo, 100 watt amp, 20 watt Kenwood speakers, bra incl., with stereo, \$9,900, without \$9,700. 427-1842.

'84 Toyota Celica hatchback, ex. cond., AM/FM stereo, new tires, drives great, \$5,200. Deena, x32427 or 338-2429.

'77 Chrysler Cordoba, 85K actual mi., 400 V-8, 2 dr., P/S, P/B, good tires, auto. trans., tan/yellow ext., runs well, comfortable work car, needs some work, \$750, OBO. Tim, x31461 or 486-2074.

'84 Ford XLT Supercab, extra clean, 2-tone blue/white, 302 eng., 3 spd. overdrive, auto. trans., \$5,000, OBO. 489-9279.

'84 Ford EXP hatchback, 40k mi., sunroof, red w/black trim, AM/FM cass., new brakes, \$3,000. Sally, x37485 or 488-5501.

'84 Cutlass Supreme Brougham, 2 dr., 2-tone sable, Landau roof, V-8, P/S, P/B, AC, 9,000 mi. on engine and tires, ex. cond. Barbara, x38618 or 333-2950.

Cycles

'81 Kawasaki 440 LTD, 10,800 mi., Vetter fairing, good cond., \$500. 333-6589.

'86 Honda ATC 250R 3-wheeler, ex. cond., many extras, \$1,000; '85 Honda 200X ATC, ex. cond., some extras, \$800. 280-8855.

Boats & Planes

'77 Cheoy Lee Clipper 33' ketch teak desks, sleeps 6, 25hp Volvo. 224-4488 or 520-9466.

Bic 180 sailboat, mast, sail, and booms, \$175. Valerie, x37824.

Audiovisual & Computers

Unitech modem/speaker phone TMS-1A, telephone, 10# auto dial, tone/pulse, hands free speaker, modem 300 baud, Bell 103 compatible, Commodore ready, \$45. Samouche, x35053 or 482-0702.

Commodore 64 peripherals, color monitor, disk drive, Gemini 10X printer, software also avail. Steve, x35272.

HP Inkjet printer, \$200; microsoft mouse w/ bus card and paintbrush software, \$100; Bizcomp modem 1200 baud, \$50. Jules, x39421 or 326-3213.

Hayes 2400 baud modem, \$380, OBO. x37192 or 996-9724.

Vic-20 computer, used 1 time, \$35. 333-4305.

Household

Queen size mattress, box springs and frame, \$125; metal desk with wood-look top and swivel chair, \$75; swivel rocking chair, \$25; two tables, \$30 and \$25; chairs, \$5 each. 482-2138.

Ash rocking chair, \$55; 4 dining chairs, \$350; 1 sofa chair, new, \$120; 1 gas grill and cover, \$50; 2 Sears prof. tool chests, \$390. x37192 or 996-9724.

Stereo console w/AKAI cass., turntable, Teac reel-reel recorder, Sansui AM/FM tuner, \$275, OBO. 486-0157.

GE Hotpoint washer and dryer, like new, used only seven months, large capacity, \$500 for pair. 486-0157.

Large heavy glass table w/4 chairs, \$140; 1979 Honda motorcycle, good cond., only 3,000 actual mi., does not run, \$200. Kay, x32251 or 331-3379.

Kenmore washer, very good cond., \$225; Kenmore elec. dryer, good cond., \$115; dining table, small and round w/one leaf and 4 chairs, \$150; Kenmore vent-a-hood, chrome, Sears best w/variable spd. exhaust fans, never installed, new, \$200, now, \$145. Curtis Wilson, x32144 or 474-2298.

New Jenny Lind baby bed, mattress and cover, \$75. Diane, 280-2289 or 338-1469.

Unused 23K/24K goldplated flatware 70-piece service for 12, finest chrome nickel steel, padded storage case, was, \$1,200, now, \$300. Cliff, x38166 or 486-8810.

Gas cook top, white, 4 burners, works fine, \$25. Dianna, x34371.

Mirrors, gold-veined, 45" x 91 1/2", two each, like new, \$200 for two or \$125 each, OBO. Doug, x32860 or 486-7412.

Wards crib w/mattress, bumper pads and sheets, \$75; baby swing, \$20; infant seat, \$20; Century car seat, \$25; changing table, \$25. Terri or Tami, x37356 or 486-6117.

GE portable 5" color TV, AC/DC, w/stereo AM/FM removable cass., like new, in box, was \$300, now \$159. 280-8796.

5 piece grade A leather furniture set, from Brazil, contemporary style, camel color, sofa, 2 arm-chairs w/headrests & matching ottomans, extremely comfortable, good cond., \$800. x38385.

Queen size waterbed, \$100. John, x35514 or 280-0623.

Bunk bed, 2 mattresses, rail and ladder, ex. cond., can be used as twin beds. 946-6658.

Studio couch, like new, white textured fabric lined nauglyde, \$150. 474-5610.

Wanted

Want lamp with magnifying lens, adjustable, clamp-on to desk or table. Shirley, x38828.

Share 3-2-2 house in Webster, garage, pool, hot tub, non-smoker, no drugs, avail. January 1, \$250/mo. plus 1/2 util. James, x38222 or 554-7659.

Want old Jon boat and canoe, cheap. x37888.

Want to assume 2-2 condo in Clear Lake. 666-8119.

Want dish racks for Magic Chef dishwasher.

Steve, x36725.

Want '82-'86 basic Ford F-150 Chevy C-10, GMC pickup, auto., P/S, short bed, pref. "Fleetside." x31604 or 333-3103.

Want drum set, good quality for adult. C.W., 282-1871.

Want baby clothes, toys, accessories, etc. for a newborn, and clothes he'll grow into. Edward, x36250 or Sheryl, 481-4889.

Photographic

Sears Telephoto lens w/case, 135mm f2.8, Pentax "K" mount, \$80 new, now \$30, OBO. Ron, 280-7428 or 554-6669.

3X telephoto converter and 75-260mm zoom Vivitar lenses, Cannon mount, \$100, OBO. 280-4381 or 484-7834.

Color video camera, Panasonic PK-957 10-prong, auto focus, power zoom lens, \$275. 333-2332 or 326-4688.

Pets & Livestock

Cocker Spaniel pups, AKC, \$150/each, born 10-19-88, will be ready for Christmas. Tamela, 480-8980 mornings or x36159 after 3 p.m.

Baby gerbils, tame, quiet, plus cage and all access., will save for Xmas. 480-9102.

Free kittens, 9-8 weeks old, real cute, 2 with, 2 without tails. 282-4271 or 996-9646.

Musical Instruments

Sale/Trade: Prof. bass guitar amp. Cerwin/Vega BG250, 250 watt head w/1 large speaker cabinet, 1-18" speaker & 1-12" speaker in folded horn enclosure, \$450 or trade for 4-track, etc. Mike, 559-2450.

Hammond organ, \$500, OBO., 1 mile from NASA. 488-0604.

Lost & Found

Bicycle missing from Mission Control Center. J. Axford, x37671.

Miscellaneous

JVC stereo cass. deck, \$100; 4 case bar refrig., \$40; 40 channel CB radio, \$35. David, x35464.

Puegot 102 MPB, less than 50 hours on engine, \$250; 19" RCA remote control TV, 5 yrs. old, needs a new remote, \$150. 554-5514 or 282-3827.

Golf clubs, Tour Model System II irons, 1-9 PW, SW, new, peripheral weighted, ex. clubs, \$185. 554-5514 or 282-3827.

Ladies size 7 English riding boots, black leather, \$40, OBO. x30122.

Transmission, manual 3 spd. for 1965 Corvair. 484-7834 or 280-4381.

Nagel's, Patrick, commemorative prints, #7, #11, #12, #13, #14, #15, \$150 to \$500. Mike, x32439 or 326-3947.

Artificial Xmas trees, 1 - 4 ft., \$7; 1 - 5, \$10, both green; trailer hitch, \$20. Tony, x35966.

Honduras ribbon mahogany, \$3.90 bd. ft. 474-4615.

Edger, trimmer, modem, Atari game set, elec. typewriter, VCR, BO. 488-9257 or 488-4828.

Exercise bike, ex. cond., \$60; French Provincial 22x34 mirror, \$25; trampoline, \$10; roll top desk, \$40, top missing; dresser, \$50 w/2 mirrors. Lorraine, 480-3377 ext. 58.

14" electric chain saw, like new, used once, \$45. David, 282-3398.

Mac 600 12 ga. reloader, includes 2 bags of shot, wads, case of primers, powder, AA empties, extra bags and dies, scales and reloading book, \$150. 280-8855.

Recliner, ex. cond., \$30; heavy duty punch bag, \$20; Avon bottles in orig. boxes from the early 70's, BO. Nina, x31612 or 488-0664.

Scuba gear and tanks, steel (72s, aluminum 80, twin 50s); weaving loom; infant clothes; porta-crib; infant battery operated Century swing; ladies golf cart, clubs and bag; recliner chair; brass bed head and footboard, queen size. 488-7224.

Wedding gown, veil, size 5, silk chiffon and lace accented with seed pearls, have pictures, \$300. 332-2229.

Treated lumber, 2x4's and 2x6's, some slightly warped or damaged, BO. Linda, x32745 or 480-3187.

Radio Shack Malibu 4x4 R.C. truck, \$100; small loom, \$30; blue hall carpet, \$10. Stacey, x32649 or 480-9793.

U.S. proof sets, penny through half dollar, 1988, \$11.50, 1987, \$12.50. 333-3763.

Window blinds, 4" wide vertical fabric slats, earth tone colors, nine sizes, \$25/each. Lee, x33499 or 333-2343.

Plate Block postage stamp collection, most between 1961-1971, sell at face value. 488-2735.

70 lb. exercise training bag; Everlast leather bag gloves, ex. cond., \$45. John, x38178 or 482-5837.

REMEMBERING APOLLO 8

Frank Borman recalls monumental achievement of first lunar flight

"In the beginning," began Bill Anders, "God created the Heaven and the Earth. And the Earth was without form and void and darkness was upon the face of the deep. And the spirit of God moved upon the face of the waters and God said, let there be light. And there was light. And God saw the light and that it was good and God divided the light from the darkness.

"And God called the light day," continued Jim Lovell, "and the darkness he called night. And the evening and the morning were the first day. And God said, let there be a firmament in the midst of the waters. And let it divide the waters from the waters. And God made the firmament. And divided the waters which were above the firmament. And it was so. And God called the firmament Heaven. And evening and morning were the second day.

"And God said let the waters under the Heavens be gathered together in one place," read Frank Borman. "And the dry land appear. And it was so. And God called the dry land Earth. And the gathering together of the waters He called seas. And God saw that it was good. And from the crew of Apollo 8, we pause with good night, good luck, a Merry Christmas and God bless all of you—all of you on the good Earth."



Twenty years ago on Christmas Eve, Commander Frank Borman, Command Module Pilot James A. Lovell, Jr., and Lunar Module Pilot William A. Anders read the preceding message to all of the people on Earth, nearly 240,000 miles away. They were the first humans to see the Earth in its entirety, the first to have a truly global view of their home planet.

Their famous message was read 86 hours into a mission that demonstrated the United States could put humans into lunar orbit. The crew splashed down in the Pacific Ocean on Dec. 27, 1968, proving that those same humans could be returned safely to Earth.

Since participating in that historic voyage, Borman has been a White House liaison (between NASA and the Nixon Administration in 1969), an international diplomat (touring the Soviet Union and helping sow the seeds for the joint U.S.-USSR Apollo-Soyuz Test Project in 1969), and an airline executive (vice president of Eastern Airlines, 1970-75; president 1975-1986). He's now the chairman of Patlex Corp., a small Los Angeles laser licensing company, and member of the board of directors for Texas Air Corp., which purchased Eastern Airlines in 1986.

Roundup interviewed Borman on the occasion of his recent visit to the Clear Lake area to promote his new autobiography, "Countdown."

Roundup: Does it seem like the Apollo 8 mission was really 20 years ago?

Borman: In some ways it seems like yesterday; in some ways it seems like it never happened. On a clear night when I look at the Moon, it seems so remote and

so beautiful I can't believe we were there. At other times you remember incidents that happened and it seems like it was just the other day.

Roundup: As you look back 20 years at Apollo 8, what are your most vivid memories about that flight?

Borman: The most vivid memory was looking back at the Earth. We were far away from home on Christmas eve and the Earth was the only thing of any color in a black and white universe. All our memories were there 240,000 miles away.

Roundup: How about its contribution to the space program?

Borman: Apollo 8 defined that it was feasible to go. We were pathfinders.

Roundup: What do you feel was its most lasting contribution to the world?

Borman: The focus on earthlings being that far away had an impact on Earth. I remember I got a telegram from somebody I had never met and never knew that said, 'Congratulations, Apollo 8 saved 1968.' I think a lot of people felt that way about the mission.

Roundup: Do you still stay in touch with Jim Lovell and Bill Anders, your crewmates on that flight?

Borman: We were just together in San Diego, and we will be together in Chicago commemorating the flight. We haven't stayed that close, but we're still good friends.

Roundup: Will you be in touch with Lovell and Anders during the anniversary?

Borman: I think the one in Chicago will be last time, and that will be earlier in December.

Roundup: I know you've gone into detail

about this in your new book, but in a nutshell what have your biggest challenges been since you left NASA? Did the time you spent working at JSC help prepare you for those challenges?

Borman: Eastern was the biggest challenge. I was at Eastern for almost 17 years. It was the third leg of my career, first the Air Force, then NASA and Eastern. Eastern was a very, very exciting challenge, in many ways as exciting as NASA. In late '70s the company had four of its best years in history. Then we ran into difficulty. The last three years at Eastern were very difficult ones.

Roundup: Were they difficult personally as well as professionally?

Borman: Yes. Everybody wants to win and it was clear we weren't winning. The reverse was true at NASA. We had the Apollo fire and then we came back with Apollo 8. At Eastern, we had the good years first and then the bad.

Roundup: What made you decide to write this book? Is there any special reason you chose to publish your book now?

Borman: After Eastern was sold, Bob Serling who was my co-author, approached me and asked me to work with him on a book. I think that was the definitive nudge. The sale of Eastern was a real watershed point in my life.

Roundup: Are there people still at JSC to whom you want to say a special hello on the anniversary?

Borman: All of the people that had a part in our mission. I have very fond feelings for everyone at NASA. Aaron Cohen and I were sent out to North American after the Apollo 1 fire. I understand his contributions and his

feelings. And is Gene Kranz still there? I say hello and I salute them.

Roundup: Were you able to watch the STS-26 launch of *Discovery*? Did it bring to mind any thoughts about the future of manned space flight for this country?

Borman: The same thoughts as a lot of people. Right or wrong, there was a lot riding on that particular flight. I think we're going in the right direction. The space station is very important. I think the primary ingredients are a clear mandate from the new president, and adequate funding.

Roundup: Do you favor any of the options that are being kicked around for the next major goal of the space program, a lunar base for instance?

Borman: It seems to me that the key to any future goals that we're lacking is experience with long-term operations in space. The space station is the key and foundation that will give you the ability to do whatever you want to do next.

Roundup: Do you have any special Christmas wishes for the people at JSC?

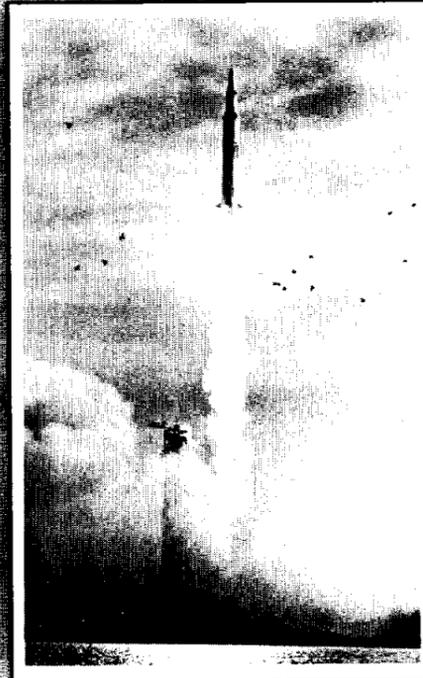
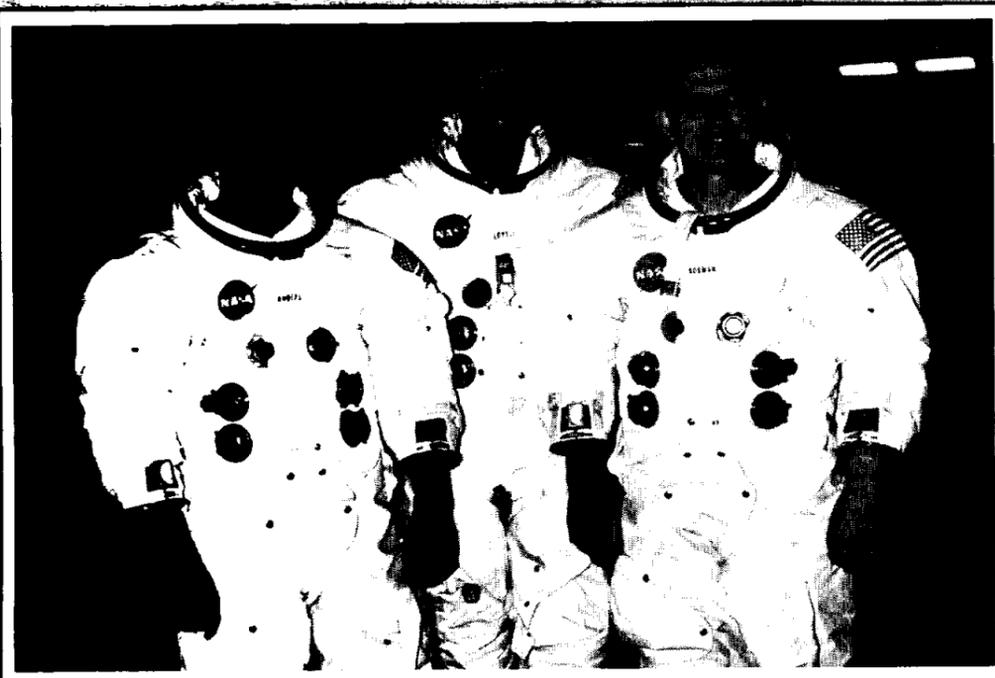
Borman: I want to wish everyone at NASA and in Houston the very best, and wish them lots of future success.

Roundup: You read a very stirring message at Christmas 20 years ago. What message would you read to the world this Christmas if you had the opportunity?

Borman: The same one. That was so appropriate.

Roundup: Would you like to read it from the same place?

Borman: No, I'm an old gray headed grandfather with too many aches and pains.



Top: A photograph of a nearly full Moon taken from the Apollo 8 Command Module. **Far left:** Bill Anders, Jim Lovell and Frank Borman stand beside the gondola in JSC's Bldg. 29 after suiting up for centrifuge training weeks before their mission began. **Left:** The Saturn IV rocket carrying the crew blasts off from Kennedy Space Center's Launch Complex 39A.

Awards recognize return-to-flight contributions

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and Martin C. Cioffoletti, all of Rockwell, Ted W. Keller and Anthony J. Macina, both of IBM, Douglas A. Rushing, Jeffrey W. Krug International, and Alan Troy, Rockwell.

JSC Certificate of Commendation: Andrew F. Algate, Humberto F. Alcantar, Joan A. Baker, Jeffrey W. Bantle, James R. Bates, Gregg J. Baumer, John W. Bearley, Robert L. Blount, Jackie W. Bohannon, James R. Brandenburg, Betty G. Brown, George W. Bull Jr., Richard D. Burghdoff, Harold T. Clayton, James L. Clement Jr., Marvin Cohn, Jerry J. Conwell, Humberto J. Davila, Linda P. DeLapp, Rebecca K. Derbonne, Izella M. Dornell, Frances L. Dromgoole; Stanley B. Easterly, David R. Forward, Richard W. Fox, Dan C. Gaskill, Walter J. Gaylor, Edward P. Gonzalez, Wayne E. Gotsch, Michael C. Gremillion, John

W. Griffin Jr.;

Robert H. Heselmeyer, Lawrence W. Hill, Marion W. Hix, Edwin W. Hoskins, Lillian M. Hudson, David P. Huntsman, Glen M. Iwai, David B. Kanipe, Gary M. Kane, Harry E. Kolkhorst, Carl L. Kotila, Jan Larson, Kathleen M. Leary, Rodney L. Lofton, Flora B. Lowes, Marion M. Lusk, Jimmy S. McLendon, Harold J. McMann, Joseph E. Mechelay, Robert W. Mitchell, William J. Moon, John C. Peck, Brian D. Perry, David E. Pitts, Ph.D., Billy W. Pratt, John G. Presnell Jr.;

Howard L. Renfro, James O. Rippey, T. Harold Robertson, Patricia A. Santy, M.D., Calvin Schomburg, Arthur L. Schmitt, Michael J. See, Raymond L. Smith, Roy J. Smith, Darrell E. Stamper, Jenny M. Stein, George F. Studor Jr., Ann S. Sullivan, Ralph J. Taeuber, John H. Temple, Edward M. Vonusa, Dwayne P.

Weary, Robert B. West, David J. Westfall and Douglas S. Whitehead.

JSC Certificate of Appreciation: Stephen M. Boone and Richard P. Bush, both of RSOC, Charles R. Capps, Bendix.

Recognition of the 1st Manned Spaceflight Control Squadron: Lt. Col. Ed. Muniz, USAF.

NASA Group Achievement Award: Ascent Flight Systems Integration Group, Ascent Vehicle Computational Fluid Dynamic Analysis Group, Crew Escape Systems Development Team, DDMS-Landing Support Team, Design Requirements Reverification Group, Independent Problem Assessment Team, Launch Systems Evaluation Advisory Team, Materials and Components Test Team, Medical Operations Group, Mission Operations Directorate Team, Mobile Launch Platform Stiffness Verification Test

Team, Mockup and Trainer Group; NSTS Program Assessment Office Team, NSTS Program Budget Office Team, NSTS Return-to-Flight PRCB Support Team, Onboard Guidance and Navigation Team, Onboard Shuttle Software Project Management Team, Orbiter Main Propulsion System Team, Payload Design Requirements Review Team, Program Compliance Assurance and Status System Team, Propulsion Systems Integration Group, RCS N204 Leak Pad Repair Team;

Safety, Reliability and Quality Assurance Team, Shuttle Ascent Performance Panel, Shuttle Avionics Integration Laboratory Team, Shuttle ECLSS and EVA Equipment Return-to-Flight Team, Shuttle EMU Dual Seal Waist Bearing Development Team, Shuttle Launch Commit Criteria Reassessment Team, Shut-

tle Operations and Maintenance Requirements Specification Team, Space Shuttle Interface Working Group, SSME Oxygen Flow Control Valve Test Team, SSME Engine Out Aerodynamics Analysis Group, STS-26 Landing Support Team, STS-26 TAL Support Team, System Integrity Assurance Program Plan Team, Technical Services Division Return-to-Flight Critical Hardware Team, Tracking and Communications Return-to-Flight Team, Tractor Rocket Evaluation Test Team.

NASA Public Service Group Achievement Award: Backup Flight Software Revalidation and Return-to-Flight Team, Primary Avionics Software System Revalidation and Return-to-Flight Team, Spacecraft Software Division Support Team, Spaceflight Meteorology Group and Space Transportation System Operations Contract Team.

Holiday decorations require proper care

Christmas decorations are springing up throughout the offices and halls of JSC, but with their beauty, decorations can be a hazard if not displayed properly.

Jay Greene, chief of the Safety Division, has offered several guidelines to ensure a safe holiday season at the center. The guidelines include: decorations cannot block passages, exits or handrails; open flames of candles or heat producing decorations are forbidden; all electrical decorations must be Underwriters Laboratory (UL) approved and aren't allowed on metallic trees; and all lights must be turned off or unplugged at the end of each day.

For Christmas trees, artificial trees are preferable. But, if a natural tree is used, several guidelines apply: the tree's size must be limited to four feet; the base of the tree must be trimmed at an angle and placed in a container of water throughout the season; the tree must be placed far away from any heat source; and the tree must be removed by Jan. 3, 1989, or earlier if the needles have become dry and brittle.

Greene said safety officials encourage employees to follow the guidelines at home as well as at the center. Employees also may wish to consider safety items, such as a smoke detector, fire extinguisher or child's car seat, as gifts this year, he added.



STS-29 STYLE—The red, white, and blue STS-29 crew patch, released Tuesday, was designed to capture and represent the energy and dynamic nature of the nation's space program. The stylistic orbital maneuvering system burn symbolizes the powerful forward momentum of the Shuttle and a continuing determination to explore the frontiers of space. The seven stars between the names of STS-29 crewmembers Mike Coats, John Blaha, Bob Springer, Jim Buchli and Jim Bagian are a tribute to the *Challenger* crew.

NASA Photo

Day care center feasible on-site

Several months of study by a centerwide committee have shown a child care facility may be feasible at JSC, and a follow-on committee has been formed to develop possible plans for such a facility, JSC Director Aaron Cohen announced recently.

"The comprehensive work of the Center Child Care Committee clearly established that an on-site child care facility is feasible," Cohen said. "Having completed this initial phase, the next step in the process will be to prepare a comprehensive plan which covers all phases of financing, constructing and operating the facility."

Several members of the direc-

tor's staff will provide advice and counsel to the committee as it develops a plan. A final decision to proceed with a child care facility will be subject to the review and approval of the committee's plan by the Director's Office.

Members of the follow-on child care committee, formed on Dec. 6 and chaired by Estella H. Gillette, include: Mary C. Allen, Erma J. Cox, Michael W. Garren, Raul E. Mejia, Michael E. Evans, Ann L. Bufkin, Debra Adams, Dane M. Russo and Judy M. Endsley. The first meeting of the committee was held last week, and the group hopes to have a plan ready by early summer.

Space News Roundup

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Lunar mission bold move, but would it work?

Elegant solution would relieve 'great hitch in Apollo's get-along'

(Continued from Page 1)

director of JSC (then the Manned Spacecraft Center) in a September 1967 memo.

For a time, the flight of Apollo 4 in August 1967 had lifted NASA's spirits. The unmanned launch, the first of a flight-ready Saturn V, went perfectly and seemed to sweep away many of the doubts still lingering from the accident eight months before. There was elation in Huntsville, at the Cape and in Houston. And in Washington, George Mueller, the associate administrator for space flight, called the test of the AS-501 vehicle "the most significant single milestone of the Apollo-Saturn program."

Then came April 1968.

On April 4, NASA launched AS-502, also known as Apollo 6. If this unmanned test flight of the Saturn V went well, the following mission would carry a crew into Earth orbit. It did not go well.

The chief designer of the rocket, Dr. Wehrner von Braun, remembered the launch in starker terms. "For two minutes everything looked like a repeat of the first Saturn V's textbook performance. Then a feeling of apprehension rolled through the launch control center when, around the 125th second, telemetered signals ... indicated an apparently mild Pogo vibration."

After the first stage dropped away, having performed nominally, the observers felt better. The five J-2 engines on the S-II second stage burned perfectly for more than four minutes. Then the number two engine began to sputter and it shut down. The number three engine shut down a split second later. After the faulty S-II stage fell away, the third stage, the S-IVB, fired and placed the test hardware into

a lopsided Earth parking orbit. Two revolutions later, the spacecraft received a command for the third stage to reignite.

It didn't. Despite repeated efforts, the J-2 engine would not start. Exasperated ground controllers succeeded in separating the Command and Service Module (CSM), firing the Service Propulsion System engine to send the spacecraft to the required altitude, and then bringing the Command Module through an atmospheric reentry sequence to at least conduct a heat shield test.

"... the flight," von Braun wrote, "clearly left a lot to be desired. With three engines out, we just cannot go to the Moon."

Although a significant problem for the Apollo program, the AS-502 launch didn't get major play in the nation's newspapers. April 4 was the day Martin Luther King was shot in Memphis. As the month of April came to a close, events were converging within the space program, events which usually converged around one man, George M. Low; events that would culminate eight months later in the voyage of Apollo 8.

By April 1968, Low had been on the job

for one year as the manager of the Apollo Spacecraft Program, responsible for the CSM and the Lunar Module (LM). He had been working six and seven days a week, 10 and 12 hours a day in what former JSC Director Dr. Christopher C. Kraft Jr. described as "a tenacious effort" to turn the program around

"These were the Apollo spacecraft: two machines, 17 tons of aluminum, steel, copper, titanium, and synthetic materials; 33 tons of propellant; 4 million parts, 40 miles of wire, 100,000 drawings, 26 sub-systems, 678 switches, 410 circuit breakers. To look after them there was a brand new program manager who would have to leap upon this fast-moving train, learn all about it, decide what was good enough and what wasn't, what to accept, and what to change. In the meanwhile, the clock ticked away, bringing the end of the decade ever closer."

—George Low
Apollo program manager

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In the spring of 1968, Low was confronted with good news and bad news. Progress in the redesign of the CSM was going better than

expected, which meant that the manned Apollo 7 Earth orbit test flight of the spacecraft could probably take place on schedule in the fall. But problems with the LM were mounting and the Apollo 8 mission, intended to be a manned Earth orbit test of both the CSM and the lunar lander in late 1968, seemed certain to fall behind schedule. The LM was, in fact, to borrow the laconic vernacular of NASA's operational world, the great hitch in Apollo's get-along.

By July, Kraft remembers, the hitch was a major headache. "George Low expressed great consternation at the problems with the LM," he recalls. "They had leaks in the fluid systems, wiring problems, and they were really struggling like hell to get the damn thing to hang together." It was at about that time that Kraft, with responsibility for flight operations and spacecraft software, was called to Gilruth's office. Also present were Donald K. "Deke" Slayton, responsible for the astronaut crews, and George Low.

"George has a proposition for you," Gilruth said.

The proposition was bold, highly secret, startling, and elegant in its simplicity. Low proposed that they bypass the lunar module, for the time being, and press on to the Moon. He suggested that with recent progress in the CSM program, there was reason to consider sending the spacecraft to the Moon, if Apollo 7 went well. If so, then Apollo 8 could reenergize the program, add critical knowledge necessary for lunar landings and make possible the goal that everyone had been working on since 1961. Low wanted to know if his idea was technically feasible.

Next week: Would it work?